

**A REVIEW OF THE LEAFHOPPER GENUS *NIELSONIA* YOUNG  
WITH DESCRIPTIONS OF NEW SPECIES (HOMOPTERA:  
CICADELLIDAE: CICADELLINAE)**

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*Abstract.*—The genus *Nielsonia* was established by Young (1977) and included four new species: *praestigia*, *pretensa*, *scissa* and *rostris*. In this paper we describe three new species from Costa Rica: *serrata*, *unica*, and *pucketti*, the latter also present in Honduras and Panamá. A revised key to all known species, based on male genitalia, is also presented. The genus ranges from Honduras (new northern record) to Ecuador.

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The genus *Nielsonia* was described and illustrated by Young (1977), who described four species: *praestigia*, *pretensa*, *scissa* and *rostris*. The latter was reported from Costa Rica with an altitudinal range of 1000 to 1600 meters; the other three species are found in Panama and *scissa* is also reported from Ecuador. In this paper we describe three new species from Costa Rica: *serrata*, *unica*, and *pucketti*. The latter is also present in Honduras and Panama, this being the first record of the genus from Honduras. Very little is known about the biology of these leafhoppers.

*Nielsonia* Young, 1977

*Nielsonia* Young, 1977. Type-species *Nielsonia praestigia* Young, 1977.

*Color.* Mustard yellow, with black spots or lines on the dorsum of the head; pronotum with two spots.

*Male genitalia.* Pygofer not strongly produced, posterior margin varying from slightly convex to shallowly concave, pygofer processes present or absent; connective broadly U- or Y-shaped; aedeagus asymmetrical with an unpaired basal process, basal apodemes greatly elongate.

Young (1977) described the female sternum VII as being moderately produced posteriorly, with the posterior margin obtusely angular or subangular. However, one of the new species described below, *N. unica*, has the posterior margin regularly and slightly concave.

MATERIAL AND METHODS

We followed Oman's (1949) method of preparing leafhopper genitalia for dissections and study, with the following modification. Each abdomen was placed separately in 10% potassium hydroxide overnight at room temperature instead of being heated. The following day we washed the genitalia for five minutes in water.

Material examined: Holotypes (all USNM) of *Nielsonia praestigia* Young, *N. pretensa* Young, *N. rostri* Young, *N. scissa* Young.

Specimens are deposited in the following collections:

CAS: California Academy of Sciences, San Francisco, USA.

INBio: Instituto Nacional de Biodiversidad, Santo Domingo, Heredia, Costa Rica.

NHM: The Natural History Museum, London, UK.

UCR: University of Costa Rica, San Pedro, San José, Costa Rica.

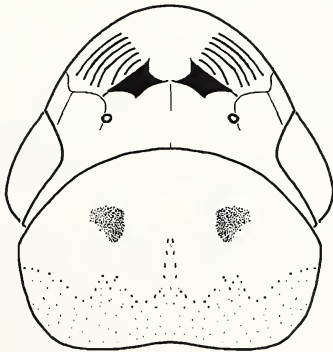
USNM: United States National Museum, Washington, USA.

USU: Utah State University, Logan, USA.

ZEAP: Zamorano Escuela Agrícola Panamericana, Tegucigalpa, Honduras.

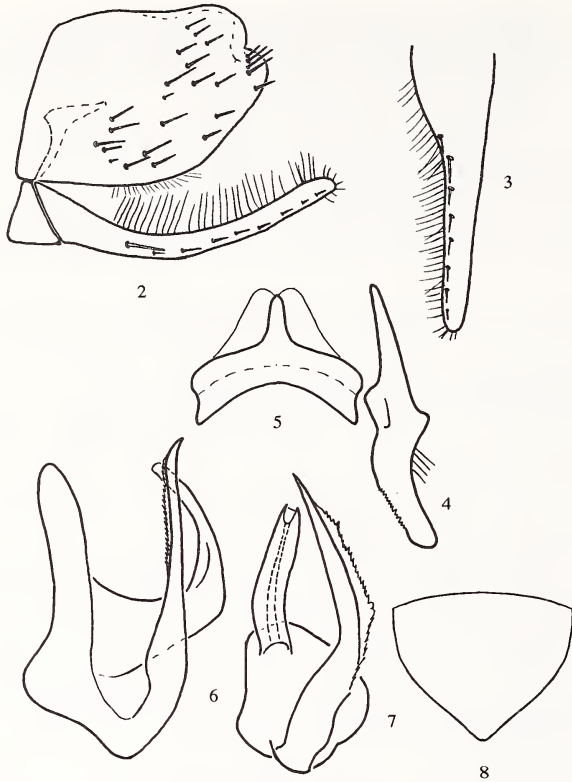
KEY TO MALES OF *NIELSONIA*

1. Pygofer with short posterior process directed ventrally . . . . . 2
- Pygofer with short posterior process directed dorsally (Fig. 23) . . . . . *pretensa* Young
2. Ventral aedeagal process with smaller lateral process near midlength (Fig. 24) . . . . . 3
- Ventral aedeagal process without lateral process . . . . . 5
3. Small lateral aedeagal process oriented perpendicular to the main ventral aedeagal process, the latter not bifurcate (Fig. 24) . . . . . *rostris* Young
- Small lateral aedeagal process oriented more or less parallel to the main ventral aedeagal process, the latter bifurcate or not . . . . . 4
4. Main ventral aedeagal process bifurcate basally (Figs. 14, 15); pygofer with posterior dorsal margin slightly concave (Fig. 10) . . . . . *unica* n. sp.
- Main ventral aedeagal process not bifurcate basally (Fig. 25); pygofer with posterior dorsal margin slightly convex (Fig. 26) . . . . . *scissa* Young
5. Pygofer with posterior process sclerotized (Fig. 17) . . . . . *pucketti* n. sp.
- Pygofer with posterior process unsclerotized (Fig. 28) . . . . . 6
6. Aedeagal process with serrate flange (Fig. 7); pygofer with posterior dorsal margin slightly concave (Fig. 2) . . . . . *serrata* n. sp.
- Aedeagal process without serrate flange (Fig. 27); pygofer with posterior dorsal margin convex (Fig. 28) . . . . . *praestigia* Young



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Fig. 1. *Nielsonia serrata*, n. sp.: Anterior dorsum (head and pronotum).



Figs. 2-8. *Nielsonia serrata*, n. sp.: 2. Pygofer, lateral view; 3. Plate, ventral view; 4. Style, dorsal view; 5. Connective, dorsal view; 6. Aedeagus, lateral view; 7. Aedeagus, caudoventral view; 8. Female abdominal sternum VII.

***Nielsonia serrata*, new species**  
(Figs 1-8)

**Description.** *Length.* Male 8.4-9.3 mm, female 8.5-9.5 mm.

*Color.* Crown except at apex, pronotum and scutellum, dull brown yellow; apex of crown, posterior two-thirds of pronotum tan, with a pair of angulate black spots on crown (Fig. 1); pair of round black spots on the pronotum before its midlength; pair of subangular black spots at base of scutellum and black spot before its apex; clypeus nearly entirely black, sometimes brown; legs tan, with forewings and often posterior portion of pronotum darker brown.

*Head.* Moderately produced, anterior margin broadly rounded in dorsal view, without carina at transition from crown to face, ocelli located slightly behind line between anterior eye angle (Fig. 1), clypeus slightly flattened, clypellus weakly pubescent apically.

*Thorax.* Pronotal width less than transocular width of head, lateral margins parallel anteriorly. Forewings with membrane including almost all of apical cells, texture

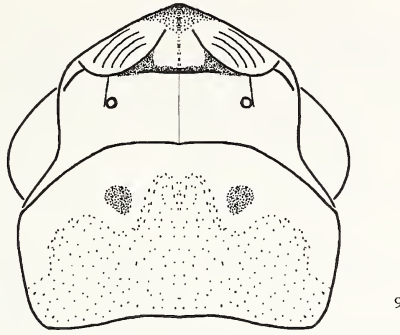


Fig. 9. *Nielsonia unica*, n. sp.: Anterior dorsum (head and pronotum).

coriaceous. Hindlegs with femoral setal formula 2:1:1, length of first tarsomere slightly longer than combined length of second and third tarsomeres.

**Male genitalia.** Pygofer with posterior margin very slightly concave below apex, with short dorsal unsclerotized process directed posteriorly but not attaining apex of pygofer (Fig. 2); plates narrowly triangular (Fig. 3), extending posteriorly beyond apex of pygofer, with uniseriate macrosetae; style extending beyond apex of connective, without apical lobe (Fig. 4); connective Y-shaped (Fig. 5); aedeagus asymmetrical, with base of shaft separated basally from ventral process, which is curved dorsally close to shaft in lateral view (Fig. 6), in caudoventral view ventral process extending dorsally parallel to shaft, narrowed in its apical half, acuminate and with serrate flange dorsally (Fig. 7).

**Female.** Abdominal sternum VII with posterior margin produced posteriorly with subangular apex (Fig. 8).

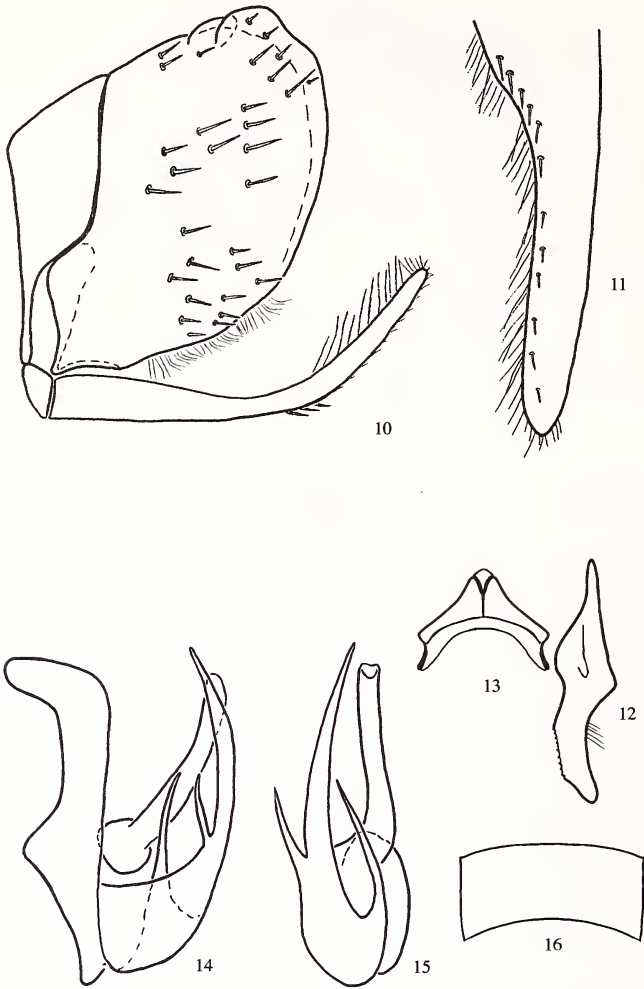
**Discussion.** *N. serrata* resembles *N. praestigia* but differs in the form of the ventral aedeagal process, the former having a serrate flange. This species has been collected from 650 to 700 meters altitude.

**Types.** Holotype, ♂, COSTA RICA, **Guanacaste**, Estación Pitilla, 700 m., 9 Km. S Sta Cecilia, II curso Parataxón, v.1990, L-N 330200–380200 (INBio). Paratypes: COSTA RICA, **Guanacaste**: 10 ♂, 2 ♀♀, same data as holotype (7 INBio, 1 CAS, 1 NHM, 1 UCR, 1 USNM, 1 USU); following specimens same data except as noted: 1♂, 1 ♀, v.1988; 1 ♂, 2 ♀♀, 21.iii–21.iv.1989; 1 ♂, vii.1988; 1 ♂, iii.1989; 2 ♂♂, x.1994, C. Moraga; 1 ♂, 19.v–3.vi.1993; 3 ♂♂, 4–23.iv.1995; 1 ♂, xii.1994, P. Rios. **Alajuela**: 1 ♂, Cerro Campana, E. side Volcán Cacao, 6 Km NW Dos Rios, 650 m., 15.vi.1988, Janzen & Hallwachs (all in INBio).

***Nielsonia unica*, new species**  
(Figs 9–16)

**Description.** *Length.* Male 8.5–10.5 mm., female 9–9.5 mm.

*Color.* Crown except at apex, apex of pronotum and scutellum, yellow; apex of crown, posterior two-thirds of pronotum brown, with an arcuate black line on each side of crown (Fig. 9); a pair of round black spots on disk of pronotum before its



Figs. 10–16. *Nielsonia unica*, n. sp.: 10. Pygofer, lateral view; 11. Plate, ventral view; 12. Style dorsal view; 13. Connective dorsal view; 14. Aedeagus, lateral view; 15. Aedeagus, caudoventral view; 16. Female abdominal sternum VII.

midlength, apex sometimes beige or with a dark pair of subangular black spots on base of scutellum and a black spot before its apex; front black to dark brown; legs yellowish tan to light orange with forewings darker brown. Head and thorax as in *N. serrata*.

**Male genitalia.** Pygofer with posterior margin slightly concave with short dorsal unsclerotized process directed posteriorly but not attaining apex of pygofer (Fig. 10); plates narrowly triangular, extending posteriorly beyond apex of pygofer, with uniseriate macrosetae (Fig. 11); style extending farther posteriorly than apex of con-



nective, without apical lobe (Fig. 12); connective Y-shaped (Fig. 13); aedeagus asymmetrical, with shaft closely associated with ventral aedeagal process, shaft weakly curved dorsally, ventral process bifurcate, one branch slightly curved dorsally close to shaft in lateral view (Fig. 14); aedeagus in caudoventral view acuminate and bearing short straight acute process at its midlength, and with another longer process basally (Fig. 15).

*Female.* Abdominal sternum VII with posterior margin regularly and slightly concave (Fig. 16).

**Discussion.** *N. unica* resembles *N. rostris* but differs in the form of the ventral process, which is bifurcate and has a short branch in *N. unica*. This species has been collected from 600 to 700 meters altitude.

**Types.** Holotype, ♂, COSTA RICA, **Alajuela**, Fca. San Gabriel 2 Km SW Dos Rios, 600 m. v.1989 GNP Biodiv. Survey 318800, 383500 (INBio). Paratypes: COSTA RICA, **Alajuela**: 11 ♂♂, same data as holotype (6 INBio, 1 CAS, 1 NHM, 1 UCR, 1 USNM, 1 USU); following specimens same data except as noted: 3 ♂♂, vi.1989; 2 ♂♂, v.1990, II curso parataxónomos. **Guanacaste**: 6 ♂♂, 2 ♀♀: Estación Pitilla, 9 Km. S Sta Cecilia, 700 m., 19.v.-3.vi.1993, C. Moraga, L-N 330200–380200; following specimens same data except as noted: 1 ♂, 18–23.vii.1993; 1 ♂, vi.1993; 1 ♂, vi.1994; 1 ♂; x.1994; 1 ♂, ii.1995; 7 ♂♂, v.1988; 1 ♂, vii.1988; 1 ♂, 1 ♀, ix.1988; 3 ♂♂, 2 ♀♀, xi.1988; 9 ♂♂, 21.iii-21.iv.1989; 13 ♂♂, 2 ♀♀, II curso parataxónomos, iv.1990; 2 ♂♂, 4–23.iv. 1995, M. Moraga; 2 ♂♂, same date, E. Alfaro; 6 ♂♂, ii.1995, P. Ríos; 1 ♂, xii.1989; 3 ♂♂, 1 ♀, vi.1991; 4 ♂♂, 2 ♀♀, xii.1994; 2 ♂♂, ix.1994; 1 ♂, ix.1988, C. Chaves, M. Espinoza; 2 ♂♂, 1 ♀, ix.1989, C. Moraga & P. Rios; 2 ♂♂, v.1988, M. Espinoza; 14.vii.1993, Gredy, Diego, Carlos; 1 ♂, 1 ♀, same locality 31.iii-29.iv.1992; 1 ♀, 31.iii-29.iv.1992 S. Rojas; viii.1994, J. Acosta, Umaña L. (all in INBio).

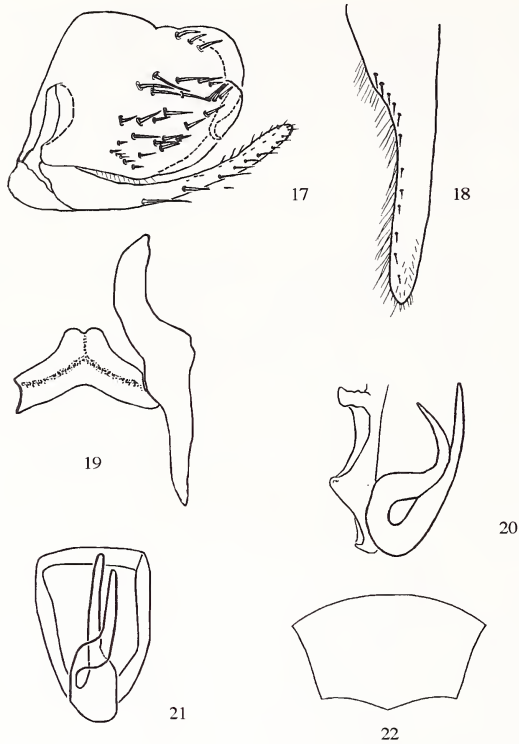
### ***Nielsonia pucketti*, new species**

(Figs 17–22)

**Description.** *Length.* Male 7.2–8.5 mm., female 7.0–8.6 mm.

*Color.* Crown except at apex, apex of pronotum and scutellum, yellow; apex of crown light beige, with a pair of angulate black spots on crown, with an arcuate black line on each side on crown; anterior portion of pronotum beige with a pair of round black spots, posterior two-thirds brown, apex sometimes beige or with a dark pair of subangular black spots on base of scutellum and a black spot before its apex; front black to dark brown; legs yellowish tan to light orange with forewings darker brown. Head and thorax as in *N. serrata*.

*Male genitalia.* Pygofer with posterior margin convex near apex, with dorsal sclerotized process arising apicodorsally directed posteriorly and attaining apex of pygofer (Fig. 17); plates narrowly triangular, extending posteriorly beyond apex of pygofer, with uniseriate macrosetae (Fig. 18); style extending farther posteriorly than apex of connective, without apical lobe; connective Y-shaped (Fig. 19); aedeagus in lateral view asymmetrical, with shaft strongly curved dorsally, narrowed in its apical half, shaft separated basally from ventral process which arises from ventral portion of atrium (Fig. 20), ventral process in caudoventral view with apex acuminate, extending dorsally parallel to shaft (Fig. 21).



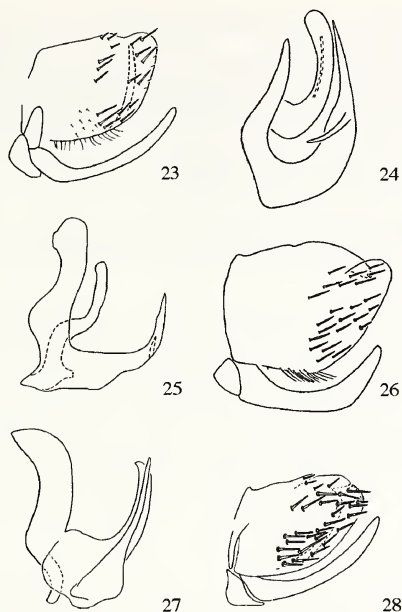
Figs. 17–22. *Nielsonia pucketti*, n. sp.: 17. Pygofer, lateral view; 18. Plate, ventral view; 19. Style dorsal view and connective dorsal view; 20. Aedeagus, lateral view; 21. Aedeagus, caudoventral view; 22. Female abdominal sternum VII.

*Female.* Abdominal sternum VII with posterior margin tranverse, slightly produced and subangulate medially (Fig. 22).

**Discussion.** *N. pucketti* resembles *N. praestigia* but *pucketti* has a dorsal sclerotized process on the pygofer. Also, the base of the aedeagal shaft is not closely associated with the base of the aedeagal ventral process. This species is found from 800 to 1500 meters altitude. A few specimens have been collected in coffee plantations.

This species is named in honor of Kirby Puckett of the Minnesota Twins, a player who will never be matched.

**Types.** Holotype, ♂, COSTA RICA, **Guanacaste**, R. San Lorenzo, 1050 m, R. F. Cord. Guanacaste (Tenorio), C. Alvarado. iv.1991, L-N-287800, 427600 (INBio). Paratypes: COSTA RICA, **Guanacaste**: 24 ♂♂, 10 ♀♀, Estación Pitilla, Fila Orosilito, 9 Km. S. Santa Cecilia, 800–1100 m., 7.iv.1995, M. Moraga, LN 328650–378600. Trampa de luz (25 INBio, 1 CAS, 1 NHM, 1 UCR, 1 USNM, 1 USU); same data except as noted: 3 ♂♂ vi.1989; 2 ♂♂, 3 ♀♀, 3–24.iv.1995, E. Alfaro; 10 ♂♂, A.C. Arenal, Zona Protectora Tenorio, Tierras Morenas, Bajo Los Cartagos, R San Lorenzo, 1050 m., iv.1991 C. Alvarado, L,N 287800, 427600; same data



Figs. 23–28. Male genitalia (modified from Young, 1977). 23. *Nielsonia pretensa*: Pygofer ventral view. 24. *Nielsonia rostris*: Aedeagus, lateral view. 25. *Nielsonia scissa*: Aedeagus, lateral view; 26. Pygofer lateral view. 27. *Nielsonia praestigia*: Aedeagus, lateral view. 28. *Nielsonia praestigia*: Pygofer lateral view.

except as noted: 1 ♂, iv.1991; 1 ♂ 28.iii-21.iv.1992; 5 ♂♂, 1 ♀, Est. Mengo, SW side Volcan Cacao, 1100 m., ii.1989, GNP, Biodiversity Survey, W 85° 28' 10", N 10° 55' 43"; 1 ♂♂, same data ii.1988, Janzen & Hallwachs; 5 ♂♂, Est. Cacao Lado SO Vol. Cacao, 1000–1400 m., v.1991, Elfin Rainforest 91; 2♂, xi-xii.1989, R. Blanco & C. Chavez; 2 ♂♂, 1400 m., 21–29.iv.1992, III curso parataxonomos. **Puntarenas**: 1 ♀, Res. Biol. Monteverde, Est. La Casona, 1520 m., ii.1993, N. Obando, LN 253250, 449700; same data except as noted: 1 ♂, vi.1991; 1 ♀, ix.1993; 1 ♂ xii.1990, E. Bello; 1 ♂, 3 ♀♀, Est. Biol. Las Alturas, 1500 m., 23.iii.-2.iv.1992, F. Araya, L-S 322500, 591300. **Alajuela**: 1 ♀, R. B. San Ramón, 900 m., 22.ii.–16.iv.1995, G. Carballo, LN 240100, 470100, Malaise; 1 ♂, **Heredia**: San Pedro de Barva, 1200 m. 30.iv.1997, J. González (on coffee); same data except as noted: 1 ♂, 14.iv.1997; 1 ♀, 20.iv.1997; 1 ♀, 15.iii.1997 (all in INBio). **HONDURAS, Cortes**: 1 ♂, San Pedro Sula, Cusuco, 1425 m. 24.ix.1994. rcol R. Cordero (ZEAP). **PANAMA, Potrerillos**: 1 ♂, 4.i.1935. J. M. MacSwain. (USNM)

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